



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,301	07/22/2003	Alexei Vitukhnovsky	SGK-2215	8389

7590 06/28/2004  
Dr. Sergei Krivoshlykov  
ALTAIR Center, LLC  
1 Chartwell Circle  
Shrewsbury, MA 01545

EXAMINER

PERRY, ANTHONY T

ART UNIT PAPER NUMBER

2879

DATE MAILED: 06/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/625,301

Applicant(s)

VITUKHNOVSKY ET AL.

Examiner

Anthony T Perry

Art Unit

2879

-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 July 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☒ Claim(s) 1-6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Objections***

Claims 1-6 are objected to because of the following informalities:

Change “-active light emitting layer, -hole injecting electrode, -hole transfer layer, -electron injecting electrode, and -electron transfer layer” to --an active light emitting layer, a hole injecting electrode, a hole transfer layer, an electron injecting electrode, and an electron transfer layer--.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the lanthanide ions" in line 15. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Marrocco, III et al. (US 2002/0028347 A1).

Regarding claim 1, the Marrocco reference teaches an electro-luminescent light emitting device (10) having a multi-layer structure deposited on a transparent substrate (22) comprising an active light emitting layer (18), a hole injecting electrode (20), a hole transfer layer (14), an electron injecting electrode (12), and an electron transfer layer (16) (see Fig. 1). The active light emitting layer comprises of organic materials having a locus comprising a lanthanide ion in the 3+ oxidative state (see for example paragraphs 0024-0029). The locus is embedded in a periphery having a hyperbranched dendrimer-like architecture (see for example paragraphs 0044-0045). The functional limitations, "...with good energy accepting properties and high light emitting efficiency embedded into a periphery with high electronic excitation and energy donating properties, collecting electron and hole charge carriers, producing excited states via the electron-hole recombination process followed by electronic excitation energy transfer from the periphery to the locus and converting the energy into the emitting light" and "...providing efficient energy transfer from triplet level of the periphery, that is efficiently excited via electron-hole recombination, to 4f orbitals of the locus, and ensuring spatial separation of the light emitting locus centers preventing concentration self-quenching of their luminescence light emission" are taught by the Marrocco reference under the principles of functional inherency since Marrocco et al. disclose all of the structural limitations.

Art Unit: 2879

Regarding claim 2, Marrocco et al. teach the active light emitting layer comprising light harvesting dendrimers (see for example paragraphs 0033-0035 and 0105). The functional limitation, “providing the electron-hole recombination on an external dendrimer shell with consequent energy transfer to said locus by one- or multi-step processes” is taught by the Marrocco reference under the principles of functional inherency since Marrocco et al. disclose all of the structural limitations.

Regarding claim 3, Marrocco et al. teach the active light emitting layer comprising a  $\pi$ -electron dendrimer (see for example paragraph 0107). The functional limitation, “providing the electron-hole recombination inside the dendrimer with consequent energy transfer to said locus” is taught by the Marrocco reference under the principles of functional inherency since Marrocco et al. disclose all of the structural limitations.

Regarding claims 4-6, Marrocco et al. teach the locus being  $Tb^{+3}$  ions,  $Eu^{+3}$  ions, and  $Sm^{+3}$  ions (see for example paragraphs 0024-0026).

#### ***Other Prior Art Cited***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Schanze et al. (US 2002/0197050 A1) reads on claims 1-6;

Lakowicz et al. (US6,660,379) teaches the use of lanthanide ions in dendrimers.

#### **Contact Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to *Anthony Perry* whose telephone number is (571) 272-2459. The examiner can normally be reached between the hours of 9:00AM to 5:30PM Monday thru Friday.

Art Unit: 2879

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel, can be reached on (571) 272-24597. **The fax phone number for this Group is (703) 872-9306.**

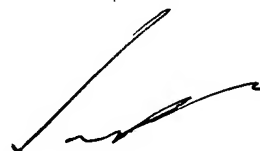
Communications via Internet e-mail regarding this application, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used by the applicant and should be addressed to [Anthony.perry@uspto.gov].

*All Internet e-mail communications will be made of record in the application file. PTO employees do not engage in Internet communications where there exists a possibility that sensitive information could be identified or exchanged unless the record includes a properly signed express waiver of the confidentiality requirements of 35 U.S.C. 122. This is more clearly set forth in the Interim Internet Usage Policy published in the Official Gazette of the Patent and Trademark on February 25, 1997 at 1195 OG 89.*

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.



Anthony Perry  
Patent Examiner  
Art Unit 2879  
June 21, 2004



Vip Patel  
Primary Examiner  
Art Unit 2879